

Regulator Change-outs

To understand what is required and what is suggested about the issue of changing out regulators, it is necessary to reference three areas:

1. Applicable Codes
2. Manufacturer's Instructions
3. Safety

Operational Issues - Reasons for Change-Outs

Nothing lasts forever. Indeed, some things do not work properly from the very beginning. It is for these reasons that regulators need to be tested and adjusted when they are initially installed and, according to the manufacture's instructions, periodically inspected and tested for proper operation. Expectations of regulators:

1. Regulators are expected to control pressure within acceptable limits - both upper and lower.
2. Regulators are expected to be capable of locking up when no demand exists on the system.
3. Regulators for typical systems are expected to provide over-pressure protection. Regulators must control pressure within acceptable limits - both upper and lower.

NFPA 58 sets maximum outlet pressures for LP-Gas regulators: First-stage: 10 psig (see 58 - 04, 5.7.3.9).

Second-stage and integral two-stage regulators shall have a maximum outlet pressure of 14 inches water column (see 58 - 04, 5.7.3.2).

The only way this information can be known is if each regulator is tested when installed and periodically thereafter, to insure it remains operating properly. It is for this reason that regulators are required to incorporate at least one testing port.

NFPA 54 sets minimum operating pressures for regulators and piping systems: The supply pressure, under maximum probable flow conditions, at the gas utilization equipment is greater than the minimum pressure required for proper equipment operation (see 54 - 02, 5.4.4).

Example: If the minimum inlet pressure to all of the appliances on a system is 11 inches water column, then the 2nd-stage regulator would need an outlet pressure above 11 inches (with all appliances in operation) to compensate for loss of pressure in the piping.

However, because of the maximum outlet pressure limitation in NFPA 58, the regulator cannot be set to higher than 14 inches water column.

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Design Improvements - Reasons for Change-outs

Consumer safety is what prompts many product improvements. As products are improved this can also be why manufactures recommend the change outs of older regulators. In addition, it should be understood that nothing lasts forever.

In regulators, rubber components such as seat discs and diaphragms deteriorate over time, from when they are manufactured - even if not in use.

In a new propane system, regulators do more than just reduce pressure. They also are designed to provide:

1. Positive shutoff when there is no appliance demand, by incorporating internal pressure relief valves, and
2. Provide over-pressure protection in the event a seat disc fails to shut off.
To accomplish these tasks, newer 1st and 2nd-stage regulators incorporate three key design changes:
 1. Improved seat disc designs that reduce the chances of the seat and disc not closing when demand decreases or stops.
 2. Larger capacity integral internal pressure relief valves, that pass more gas through to the bonnet and vent discharge opening of the regulator to the open atmosphere, helping to maintain allowable pressure in the piping system, and
 3. Larger vent discharge assemblies allow for a greater volume of gas to discharge to the open atmosphere, helping to eliminate over-pressure in the downstream gas piping and the possible failure of gaskets and diaphragms of appliance control valves, resulting in gas leakage, explosions, and fires inside of structures.

What all of this means:

1. Changing regulators every fifteen years is not a code requirement.
2. Identifying older regulators, which do not incorporate internal pressure relief valves and large vents, and replacing these with new improved models, will insure greater customer safety.
3. Companies should not assume that all new regulators, will operate properly "out of the box". Each regulator should be tested when initially being placed into service.
4. Recognizing that regulators wear out and therefore need to be inspected and tested periodically, will insure a much greater level of customer safety.
5. Any regulator that does not satisfactorily pass inspections or tests should be replaced.
6. Always document inspections and tests performed.